

Serial No. 09/911,228
Filed: 07/21/01
Page 2 of 11

Examiner: Terrence R. Till
Group Art Unit: 1744

Amendments to the Claims

Please amend the claims as shown below in the complete listing of claims.

1. (Previously presented) A unitary portable surface cleaning apparatus, comprising:
 - a fluid dispensing system including at least one fluid supply tank, a fluid distributor connected to the fluid supply tank through a fluid supply conduit for applying a cleaning fluid to a surface to be cleaned at a predetermined rate;
 - a fluid recovery tank for holding recovered fluid;
 - a suction nozzle;
 - a working air conduit extending between the recovery tank and the suction nozzle; and
 - a vacuum source in fluid communication with the recovery tank for generating a flow of working air from the suction nozzle through the working air conduit and to the recovery tank to thereby recover fluid from the surface to be cleaned through the suction nozzle and working air conduit and into the recovery tank;
 - a heater exchanger, including a heater element, associated with the fluid supply conduit for heating the cleaning fluid in the fluid supply conduit to be applied to the surface to be cleaned;
- the improvement which comprises:
- the heat exchanger includes a heat storage body for storing heat energy from the heater element, and wherein the heater element and the heat storage body are designed to heat the cleaning fluid in the fluid supply conduit to a predetermined temperature range to the extent that the cleaning fluid flows intermittently through the fluid supply conduit but not to the extent that the cleaning fluid flows continuously through the fluid supply conduit at the predetermined rate;
- whereby the heater exchanger is designed to store heat energy during dry cycles so that there is sufficient heat energy to heat the cleaning fluid to a temperature in the

Serial No. 09/911,228
Filed: 07/21/01
Page 3 of 11

Examiner: Terrence R. Till
Group Art Unit: 1744

range of about 130 to 180° F during a wet cycle when the cleaning fluid is flowing at the predetermined rate.

2. (Cancelled)

3. (Previously presented) A portable surface cleaning apparatus according to claim 1 and further comprising a temperature sensor for sensing the temperature of the heat storage body and for controlling the heater element to maintain the temperature of the heat storage body in the range of 150 to 180° F.

4. (Original) A portable surface cleaning apparatus according to claim 1 wherein the heat exchanger is designed to elevate the temperature of the cleaning fluid at least 15 degrees Fahrenheit at a rate of approximately 850 milliliters per minute.

5. (Original) A portable surface cleaning apparatus according to claim 4 wherein the heat exchanger is designed to elevate the temperature of the cleaning fluid approximately 16 degrees Fahrenheit at a rate of approximately 850 milliliters per minute.

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Previously presented) A portable surface cleaning apparatus according to claim 28 wherein the electrical heating element and the size of the heat storage body are selected to elevate the temperature of the cleaning fluid within the heat exchanger from room temperature to a temperature in the range of 130 to 200 degrees Fahrenheit within 30 seconds.

Serial No. 09/911,228
Filed: 07/21/01
Page 4 of 11

Examiner: Terrence R. Till
Group Art Unit: 1744

11. (Previously presented) A portable surface cleaning apparatus according to claim 28 wherein the electrical heating element and the size of the heat storage body are selected to elevate the cleaning fluid within the block heater from room temperature to a temperature in the range of 150 to 180 degrees Fahrenheit within 20 seconds.

12. (Original) A portable surface cleaning apparatus according to claim 11 and further comprising a temperature sensor for sensing the temperature of the heat storage body and for controlling the electrical heating element to maintain the temperature of the cleaning fluid within the heat storage body in the range of 150 to 180 degrees Fahrenheit.

13. (Cancelled)

14. (Previously presented) A portable surface cleaning apparatus according to claim 29 wherein the relatively short period of time is within 20 seconds.

15. (Cancelled)

16. (Original) A portable surface cleaning apparatus according to claim 1 wherein the fluid dispensing system further comprises a pump to deliver the cleaning fluid to the surface to be cleaned at the predetermined rate.

17. (Previously presented) A unitary portable surface cleaning apparatus, comprising:

a fluid dispensing system including at least one fluid supply tank, a fluid distributor connected to the fluid supply tank through a fluid supply conduit for applying a cleaning fluid to a surface to be cleaned at a predetermined rate;

a fluid recovery tank for holding recovered fluid;

a suction nozzle;

a working air conduit extending between the recovery tank and the suction nozzle;

Serial No. 09/911,228
Filed: 07/21/01
Page 5 of 11

Examiner: Terrence R. Till
Group Art Unit: 1744

a vacuum source in fluid communication with the recovery tank for generating a flow of working air from the suction nozzle through the working air conduit and to the recovery tank to thereby recover fluid from the surface to be cleaned through the suction nozzle and working air conduit and into the recovery tank;

a heater exchanger, including an electrical heating element, associated with the fluid supply conduit for heating the cleaning fluid in the fluid supply conduit to be applied to the surface to be cleaned and a heat storage body for storing heat energy from the electrical heating element; wherein the electrical heating element is adapted to continuously supply at least about 500 watts of power from an ordinary 120 volt line; and

wherein the electrical heating element and the vacuum source are connected to a common electrical input and are both adapted to be powered by a common 120 volt power source.

18. (Cancelled)

19. (Original) A portable surface cleaning apparatus according to claim 17 wherein the fluid dispensing system further comprises a pump to deliver the cleaning fluid to the surface to be cleaned at the predetermined rate.

20. (Previously presented) A unitary portable surface cleaning apparatus, comprising:

a fluid dispensing system including at least one fluid supply tank, a fluid distributor connected to the fluid supply tank through a fluid supply conduit for applying a cleaning fluid to a surface to be cleaned at a predetermined rate;

a fluid recovery tank for holding recovered fluid;

a suction nozzle;

a working air conduit extending between the recovery tank and the suction nozzle;

Serial No. 09/911,228
Filed: 07/21/01
Page 6 of 11

Examiner: Terrence R. Till
Group Art Unit: 1744

a vacuum source in fluid communication with the recovery tank for generating a flow of working air from the suction nozzle through the working air conduit and to the recovery tank to thereby recover fluid from the surface to be cleaned through the suction nozzle and working air conduit and into the recovery tank; and

a heater exchanger, including an electrical heating element, associated with the fluid supply conduit for heating the cleaning fluid in the fluid supply conduit to be applied to the surface to be cleaned and a heat storage body for storing heat energy from the electrical heating element; wherein the electrical heating element is adapted to continuously supply up to about 10,000 joules of energy to the heat storage body in about 30 seconds or less; and

wherein the electrical heating element and the vacuum source are connected to a common electrical input and are both adapted to be powered by a common 120 volt power source.

21. (Original) A unitary portable surface cleaning apparatus according to claim 20 wherein the electrical heating element is adapted to continuously supply deliver up to 10,000 joules of energy to the heat storage body in about 20 seconds.

22. (Cancelled)

23. (Previously presented) A portable surface cleaning apparatus according to claim 31 wherein the electrical heating element and the size of the heat storage body are selected to elevate the cleaning fluid within the fluid supply conduit to a temperature in the range of 150 to 180 degrees Fahrenheit.

24. (Cancelled)

25. (Previously presented) A portable surface cleaning apparatus according to claim 31 and further comprising a housing mounting the at least one fluid supply tank, the fluid recovery tank and the vacuum source, and a wand connected to the housing and

Serial No. 09/911,228
Filed: 07/21/01
Page 7 of 11

Examiner: Terrence R. Till
Group Art Unit: 1744

wherein the suction nozzle is mounted to one end of the wand and the wand defines in part the working air conduit.

26. (Previously presented) A portable surface cleaning apparatus according to claim 31 wherein the fluid dispensing system further comprises a pump to deliver the cleaning fluid to the surface to be cleaned at the predetermined rate.

27. (Cancelled)

28. (New) A unitary portable surface cleaning apparatus, comprising:
a fluid dispensing system including at least one fluid supply tank, a fluid distributor connected to the fluid supply tank through a fluid supply conduit for applying a cleaning fluid to a surface to be cleaned at a predetermined rate;
a fluid recovery tank for holding recovered fluid;
a suction nozzle;
a working air conduit extending between the recovery tank and the suction nozzle;
a vacuum source in fluid communication with the recovery tank for generating a flow of working air from the suction nozzle through the working air conduit and to the recovery tank to thereby recover fluid from the surface to be cleaned through the suction nozzle and working air conduit and into the recovery tank;
a heat exchanger, including an electrical heating element and a serpentine conduit formed therein and connected to the fluid supply conduit for conducting cleaning fluid through the heat exchanger for heating the cleaning fluid in the fluid supply conduit to be applied to the surface to be cleaned;
wherein the heating element and the vacuum source are connected to a common electrical input and are adapted to be powered by a common 120 volt power source; and
the heat exchanger includes a heat storage body for storing heat energy from the heater element, and wherein the heater element and the heat storage body are designed to heat the cleaning fluid in the fluid supply conduit to at least 130°F when the cleaning fluid flows intermittently through the fluid supply conduit at the predetermined rate.

Serial No. 09/911,228
Filed: 07/21/01
Page 8 of 11

Examiner: Terrence R. Till
Group Art Unit: 1744

29 (New) A unitary portable surface cleaning apparatus, comprising:

a fluid dispensing system including at least one fluid supply tank, a fluid distributor connected to the fluid supply tank through a fluid supply conduit for applying a cleaning fluid to a surface to be cleaned at a predetermined rate;

a fluid recovery tank for holding recovered fluid;

a suction nozzle;

a working air conduit extending between the recovery tank and the suction nozzle;

and

a vacuum source in fluid communication with the recovery tank for generating a flow of working air from the suction nozzle through the working air conduit and to the recovery tank to thereby recover fluid from the surface to be cleaned through the suction nozzle and working air conduit and into the recovery tank;

a heat exchanger, including an electrical heating element, associated with the fluid supply conduit for heating the cleaning fluid in the fluid supply conduit to be applied to the surface to be cleaned;

the improvement which comprises:

the heat exchanger includes a heat storage body for storing heat energy from the heating element, and wherein the heating element and the heat storage body are designed to heat the cleaning fluid in the fluid supply conduit at least 30 degrees to a temperature in the range of 150 to 180° F when the cleaning fluid flows through the fluid supply conduit intermittently at the predetermined rate, the electrical heating element and the vacuum source are connected to a common electrical input and are adapted to be powered by a common power source common 120 volt power source.

30. (New) A unitary portable surface cleaning apparatus, comprising:

a fluid dispensing system including at least one fluid supply tank, a fluid distributor connected to the fluid supply tank through a fluid supply conduit for applying a cleaning fluid to a surface to be cleaned at a predetermined rate;

a fluid recovery tank for holding recovered fluid;

Serial No. 09/911,228
Filed: 07/21/01
Page 9 of 11

Examiner: Terrence R. Till
Group Art Unit: 1744

a suction nozzle;

a working air conduit extending between the recovery tank and the suction nozzle; and a vacuum source in fluid communication with the recovery tank and the suction nozzle for generating a flow of working air from the suction nozzle through the working air conduit and to the recovery tank to thereby recover fluid from the surface to be cleaned;

a heat exchanger, including a heating element, associated with the fluid supply conduit for heating the cleaning fluid in the fluid supply conduit to be applied to the surface to be cleaned;

the improvement which comprises:

the heat exchanger includes a heat storage body for storing heat energy from the heater element, wherein the heating element and the heat storage body are designed to heat the cleaning fluid in the fluid supply conduit to at least 130° F at least when the cleaning fluid flows intermittently through the fluid supply conduit; and

wherein the fluid dispensing system includes a valve having an inlet connected to the at least one fluid supply tank and a pair of outlets, a first fluid tube and a second fluid tube connected to the valve outlets, whereby the valve is adapted to selectively control the flow of cleaning fluid from the at least one fluid supply tank to the first and second fluid tubes or a combination thereof, and the heat exchanger is connected to the first fluid tube, whereby the valve can selectively direct heated or unheated cleaning fluid, or a combination thereof, to the surface to be cleaned.

31. (New) A unitary portable surface cleaning apparatus, comprising:

a fluid dispensing system including at least one fluid supply tank, a fluid distributor connected to the fluid supply tank through a fluid supply conduit for applying a cleaning fluid to a surface to be cleaned at a predetermined rate;

a fluid recovery tank for holding recovered fluid;

a suction nozzle;

a working air conduit extending between the recovery tank and the suction nozzle;
and

Serial No. 09/911,228
Filed: 07/21/01
Page 10 of 11

Examiner: Terrence R. Till
Group Art Unit: 1744

a vacuum source in fluid communication with the recovery tank for generating a flow of working air from the suction nozzle through the working air conduit and to the recovery tank to thereby recover fluid from the surface to be cleaned through the suction nozzle and working air conduit and into the recovery tank;

a heat exchanger, including an electrical heating element, associated with the fluid supply conduit for heating the cleaning fluid in the fluid supply conduit to be applied to the surface to be cleaned;

the improvement which comprises:

the heat exchanger includes a heat storage body for storing heat energy from the heating element, and wherein the heating element and the heat storage body are designed to heat the cleaning fluid in the fluid supply conduit to a temperature of at least 130° F when the cleaning fluid flows through the fluid supply conduit intermittently at the predetermined rate, the electrical heating element and the vacuum source are connected to a common electrical input and are adapted to be powered by a common 120 volt power source.

32. (New) A unitary portable surface cleaning apparatus according to claim 31 wherein the heating element and the heat storage body are further designed to heat the cleaning fluid at least 15° F when the cleaning fluid flows through the fluid supply conduit at a rate of approximately 850 milliliters per minute.